



In August we had just turned onto the Pacific Coast Highway when I got an evacuation alert! The phone message disappeared before I could figure out where the danger was. Looking around, cars were traveling in both directions and there was no smoke in sight. Our friend texted; we were safely north of the fire. The alert was from the early warning system (EWS).[1] To be effective, EWS require four elements: risk knowledge, forecasting hazards, communicating warnings, and response preparedness.

Such alerts are not available to all. Cell phones make sending alerts easier, but cellular service can fail in disasters, reception varies, and phones may not be charged. Redundancy helps to spread and reinforce warnings, using multiple channels such as TV, radio, social media, apps, sirens, loudspeakers, and going door-to-door. Rural and remote regions around the world are still difficult to reach. The alert should say what, where, and when the hazard is, how bad and how certain the info, and what action to take. Language, literacy, unfamiliar terms, and lack of confidence in the source of the message may be barriers.[2] Word of mouth from a trusted source is powerful; our friend was key to deciding what to do after the alert.

Many people will not act, for a variety of reasons: underestimating the severity of the risk, relying on recent experience, optimism bias (it can't happen to me or I can handle it), too many false alerts, lack of means.[3] Early or anticipatory actions can help prevent or lessen impacts. These are often cash distributions released at pre-arranged hazard levels, used for example to fortify housing or relocate people, equipment, and livestock proactively.[4] Drills are a way to practice a difficult decision. Spokane, Washington ran a wildfire evacuation drill in April. Three months later, hundreds of homes burned in the Spokane Complex Fire and more than 60,000 residents evacuated.[5]

After a devastating cyclone in 1970, Bangladesh established its Cyclone Preparedness Programme. Two coastal radars grew into a network of weather stations. Cyclone shelters increased from 44 to nearly 4000, also serving as schools and community centers. Over 76,000 community volunteers use sirens, flags, and megaphones to alert villagers and assist more the more vulnerable (children, pregnant women, frail elderly, people with disabilities) to evacuate. Women, who now make up half the volunteers, are able to access women isolated by cultural norms and coach them to shelter. Their participation also elevates the social standing of women. Death tolls are notably lower.[6] Bangladesh is a model of how people-centered and locally led EWS can help warnings be received, understood, culturally acceptable, and acted upon.

Globally, 136 (77% of 176) countries report having an EWS, up from 55 countries in 2015, with international initiatives aiming for EWS to protect everyone on Earth by 2027. Annual average mortality from disasters declined 65% in this decade compared to the previous decade, but twice as many people were affected by disasters.[7] Mortality is less when EWS is more comprehensive.[8]

Gaps in governance, financing, and infrastructure remain. Weather forecasting in low income countries lags 20 years behind high income countries.[9] Better coordination is needed between national and local governments and across borders (e.g. to share satellite data).[10] Multiple and different types of hazards with different timeframes are a challenge.[11] Some hazards are hard to predict, like earthquakes, flash floods, landslides, glacial lake outburst floods,[12] but even seconds before an earthquake may be enough to control a train or take cover.[13] Having 24 hours' notice of an impending storm can cut damages by 30%. EWS is part of disaster management and a cost-effective climate adaptation strategy.[14]

Hazards are a kind of alert, too, calling for us to reduce fossil fuel emissions *faster*, prepare *sooner*. Newspapers report on failures to issue warnings, protect from fire, or keep evacuations orderly, but I think

these reflect our collective failure to imagine the unprecedented. EWS, disaster management, and adaptation are increasingly local; it's up to us to get communities to prepare, build fire brigades, spend now to save lives and assets later. The US midterm elections give us a vote in shaping our future.

Note: I'm sending a special thank you to Wendy and friends and subscribers from Bethlehem Central High School. Have a fantastic reunion! I'm sorry I won't be there but send warm greetings to all.

WHAT YOU CAN DO: Get ready (even if you missed National Preparedness Month in September)

- Sign up to receive emergency alerts from your city, and also state and federal alerts. Check that your phone is set to allow notifications from Government Alerts and weather apps.
- Make an emergency plan, listing all household members, emergency contacts (local and out-of-town), meeting places, school names and phone numbers for kids, local emergency numbers. Print a hard copy for each person.
- Gather medical info including doctor's name and phone number, prescriptions, medical devices, and copy of health insurance card. Record special needs for kids, elderly, those with disabilities or mobility issues; pets.
- Collect documents: identification, home deed, car title/registration, insurance info, financial records (bank accounts), wills, powers of attorney. Keep these in a waterproof bag. Make and share copies with family/caregivers.
- Pack a Go Bag with food, water, clothing, medications and medical equipment (or know where to find them in a hurry), and documents. Pack for kids and pets. Perhaps add cash in small bills; a map with different evacuation routes marked.
- Stock up on supplies for when you can't leave: enough water and food not needing refrigeration or cooking for at least 72 hours, pet food, and manual can opener; first aid kit, flashlight, work gloves, soap/sanitizer, wrench or pliers.
- Remember your cell phone and charger, power pack or portable USB charger.
- Help friends and neighbors get ready.

Resources:

- > Ready.gov: Build a kit (<https://www.ready.gov/kit>)
- > Disaster ready guide (<https://firesafemarin.org/wp-content/uploads/Disaster-Ready-Guide-2021-English.pdf>)
- > How to prepare for a disaster. Gilpin L. <https://grist.org/extreme-weather/how-to-prepare-for-a-disaster/>



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[7] Sendai Framework Monitor data and analytics (<https://www.undrr.org/implementing-sendai-framework/monitoring-sendai-framework/sfm-data-and-analytics>)

As of September, 136 countries report having an EWS. United Nations press release, 2026

(https://www.un.org/sites/un2.un.org/files/early_warning_systems_press_release.pdf)

“Effective early warning” video (<https://www.youtube.com/watch?v=HxfcCgwfCXE&t=2s>)

[8] UNDRR (UN Office for Disaster Risk Reduction) (<https://www.undrr.org/reports/global-status-MHEWS-2024>) Table 1. Disaster-related mortality is 6 times higher with limited vs comprehensive EWS.

[9] Global inequalities in weather forecasts. Linsenmeier M & Shrader JG, 2023

(<https://doi.org/10.1038/s41467-026-77630-w>); podcast with transcript

(<https://www.resources.org/resources-radio/inequality-in-weather-forecasts-around-the-world-with-jeff-shrader/>)

One-day-ahead forecasts in low-income countries today are as accurate as day-ahead forecasts in high-income countries 20 years ago. Forecasting is harder in the tropics, but infrastructure also lags.

[10] Disaster early-warning systems can succeed – but collective action is needed. Tupper AC & Fearnley CJ, 2023 (<https://www.nature.com/articles/d41586-023-03510-8>)

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